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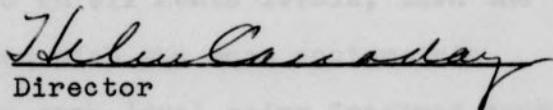
STABILITY OF SOCIAL RELATIONSHIP IN TWO  
GROUPS OF PRESCHOOL CHILDREN AS  
MEASURED BY A PICTURE  
SOCIOMETRIC TECHNIQUE

by  
Rivka R. Kolari Kutchei

A Thesis Submitted to  
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KUTCHEI, RIVKA R. KOLARI. Stability of Social Relationship in Two Groups of Preschool Children as Measured by a Picture Sociometric Technique. (1967) Directed by: Dr. Helen Canaday pp. 66.

A picture sociometric testing technique was used to study peer acceptance and rejection in a group of twelve three year old and twelve four year old children, enrolled in the School of Home Economics Nursery School at the University of North Carolina at Greensboro. The sociometric scores for the children derived from this test were related to the age of the children and to their teachers' judgment scores (TJS). The following hypotheses were tested:

(1) there is no significant association between the sociometric scores on three different tests administered three weeks apart; (2) that the older the children, the higher their sociometric score; and (3) there is no significant difference between the children's sociometric scores and the teachers' judgment scores.

The two groups of preschoolers were given a series of three sociometric tests, administered three weeks apart. Both choice and rejection responses were considered and were weighted on a scale ranging from a +5 to a -5.

The sociometric scores of the first, second and third tests were correlated to determine the stability of the responses. Age was considered in six month levels, then the mean age in each was correlated with the mean sociometric scores (SS) of the children in each level using Spearman rank correlation coefficients. The teacher's judgment scores were

the mean evaluation scores for each of the two teachers in each of the two groups. The Wilcoxon matched-pairs signed-ranks test was used to determine the difference between SS and TJS.

No association was found to exist between the age of the children and their SS. The null hypothesis that there was no association between the SS of the three different tests was rejected for choice responses only of the children in the four year old group. It would appear then, that stability of positive social relationship does exist among the four year olds in the group studied. The null hypotheses that there was no difference between the SS of the children and TJS was accepted. The implication therefore is that these four year old children were able to express through this kind of sociometric test, their choices and rejections of their peers and to reflect by observable action their social interactions within their peer group. The investigator found three year olds' responses vague and lacking in spontaneity. Their responses indicated the non-existence of or the lack of ability to express such relationships at the three year age level. The instrument used might be said to be inadequate in eliciting true and meaningful responses from three year old children.

The present study pointed to the pressing need for further research in the area of preschool sociometry, particularly testing techniques to use with three year old children.



## APPROVAL SHEET

This thesis has been approved by the following committee of the Faculty of the Graduate School at the University of North Carolina at Greensboro.

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## CHAPTER I

### INTRODUCTION

As society increases in size it tends to become more exclusively group oriented. Belonging to groups and functioning successfully in them has become one of the major values of the American Society. Leadership and popularity have become marks of success and personal adjustment and are ends toward which American parents and educators strive in their child rearing practices. Yet the area of group life and interpersonal peer relations in the formative years has been sadly neglected. Moreno, Lewin, Bavelas, Festinger, to name a few, have been prime forces in the study of group dynamics and have contributed both theory and research methodology. However, the major stress lay in the study of adult groups and only later did the research involve children, but only of later school age. Very few studies have delved into group dynamics with the very young, who are referred to as preschoolers. With education programs being extended in scope to include younger children, it becomes essential for teachers and other child development personnel, to be aware of the intricacies of interpersonal relationships of children at a very young age. To acquire the knowledge for new theories to guide us in dealing with

groups of very young children new techniques for studying such groups must be found and perhaps some of the old ones must be refined and improved.

Sociometric tests have been found to be among the best techniques, to date, for arriving at a determination of social acceptance among members of a group. Acceptance or rejection, the way others feel about a particular individual, will effect to a large extent the way he feels about himself. A child, in the course of growing up, first in the family and then from about the age of two or three, with his peers, develops the very important self concept. This view of self will affect his future mental and emotional growth and the way he will utilize both his native potentialities and his learning. An individual can develop fully only in interaction with his fellow humans. It is most important therefore, that the beginning of peer interaction will be as satisfying to the individual as possible in order to promote a worthwhile and a stable self image. Sociometry can provide the teacher or group worker with information on children's acceptance, leadership potential, social rejects and isolates in a group. With knowledge of problems the teacher can aid children in improving their social adjustments and can use the sociometric information to that end. Florence Moreno (1942) pioneered in the study of sociometric status among preschoolers. The University of Toronto led in the area of preschool sociometry during the 1940's. More

recently, during the sixties, Boyd McCandless and his associates have contributed greatly to the study of social relationships among preschoolers of different socioeconomic status. The picture sociometric technique developed by McCandless and Marshall (1957) appeared to facilitate administration of sociometric tests to very young children and to be quite meaningful to these children. Most of these studies, however, were confined to four and five year olds. The need still exists to reach the three year olds, which is the age at which group experience begins for many children.

The present study attempted to use the picture sociometric technique with three year olds as well as four year olds; to relate the sociometric scores of these children to age and teacher judgments; and to determine the stability of these scores.

The study was carried out with the twenty-four children enrolled at the University of North Carolina Nursery School. Because of the group selected for investigation certain limitations were set on this study: the population was not a random sample; the subjects were all white and from upper middle class homes; because children came in car pools the subjects could not all be interviewed upon arrival, and prior to their having peer contact on the testing days; and the degree of "prior to school" acquaintance among the children could not be controlled.

The basic assumptions underlying this study were that,



at these age levels a relatively stable social relationship does exist, such a relationship can be indicated by each member of the group in response to visual recall of his peers, and stability can be measured in preschool children.

In the present study social relationship was defined as activity or interaction with one or more specific peers. Sociometric choice indicated preferred peer interactor: first choice being the first child named by a respondent, second and third choices were the second and third children named by the respondent. Sociometric rejection was the indicated non-preferred peer interactor. The first child thus named by a respondent was considered the most rejected peer, the second somewhat rejected, and the third mildly rejected. Sociometric score indicated the relative status of a child in his group according to the interaction preference responses of his peers. A higher score indicated greater acceptance by peers, a lower score indicated less acceptance. Teacher judgment scores were personal evaluations of the teachers, of each child's social relationships observed during the time period which corresponded to the testing days. To determine the objectives stated earlier the following hypotheses were to be tested: (1) There is no significant association between the sociometric scores on three different tests, administered three weeks apart. (2) That the older the child, the higher is his sociometric score; and (3) There is no significant difference between the children's

sociometric scores and the teachers' judgment scores.

In the remainder of the thesis a review of the literature will be presented in the second chapter; in chapter three there is a description of the methods under the subheadings of subjects, procedure and treatment; the findings will be discussed in chapter four; a summary, conclusions and recommendations for further investigation will be presented in chapter five.

## CHAPTER II

### REVIEW OF LITERATURE

Social and behavioral scientists began to investigate social relations among children in the late 1920's and early 1930's. These investigators attempted to discover techniques for measuring various phases of social relationships even prior to J. L. Moreno's classic publication, Who Shall Survive (1937). The present study was limited to a review of the literature published since 1940.

Rosemary Lippit (1941), in a study of popularity among preschool children at the Iowa Child Welfare Research Center, used the paired comparison method to obtain popularity score for each of 45 children. When she compared these to teacher estimates of the children's popularity she found the two inconsistently related. She stated that the children's ratings of popularity and the teachers' estimates appeared to be based on different criteria. The teachers seemed to base their judgment on the children's social participation.

When judging popularity among children, adults are likely to base their estimates upon behavioral criteria...(they) seem to judge the socially active child as popular and the isolated child as unpopular (p. 331).

Florence Moreno (1942) pioneered in studying

sociometric status of children in a nursery school group.

She defined sociometric status as

...the position of a child in a group formed by children of about the same age level...determined by the number of contacts which he initiates or which are initiated by others toward him, and the acceptance or rejection pattern resulting from these contacts (p. 395).

The group studied consisted of 12 children, who ranged in age from two to five years. All were of the same socioeconomic background and none were below average in intelligence. Because this was the children's first group experience, Moreno did not begin her testing for a month after school began. She felt this period of time would allow for some social adjustment. Data were gathered from observations of the children's spontaneous activity, their verbal choices and experimental procedures. The experimental procedure consisted of removing the first child chosen for play, from the situation, to effect a second playmate choice. Moreno argued that in the case of the young child only his first choice is immediate to him and asserted that he is not yet capable of expressing lower levels of preference, which can be discovered only through observations of experimental situations. Moreno concluded that children of preschool age develop a significant social status in groups of their own, based not on prestige factors, but on earliest interpersonal relations as they appear in spontaneous groupings; that there are persistent patterns of attractions and



repulsions characteristic for a child at different points in time. (i.e. there are children of high and children of low sociometric status); that children develop various degrees of intensity of relationships for one another.

Mary Northway (1943) reported on three studies of social relationships done at the University of Toronto. The study of four year old children suggested that, "preference (not chance factor) for companions is present at the nursery school age level and that these preferences become considerably stabilized in the older children" (p. 432). The study of 36 preschool children concluded that, "children on the preschool level are differentiated in terms of the extent to which they are acceptable to others"; "that there is considerable consistency in a child's degree of acceptability... this consistency is greatest with the most highly acceptable children and the least acceptable children. Those in the middle quartile change their rank position to a greater degree"... "the older half of the group obtain higher scores than the younger children" and that "83% of the names given as first choice remained as first choice throughout the four tests; 78% of the second choices and 74% of the third choices remained" (p. 430).

Bonney (1943) in a study of children from second, third, fourth, and fifth grades from three schools in Denton, Texas, was interested in the relationship between social status as measured by pupil choice and social success as

measured by teacher judgments. The choosing situations offered the children, varied from five to eight in each grade, and were presented one month apart throughout the year. The general social acceptance score per child was the average percentage score received on all the choosing situations throughout the school year. The teachers were given rating forms which they used to place the children in weighed quartiles by groups (highest, above average, about average, below average and lowest). Judgments were based on observations only and the teachers were not told the children's sociometric scores. There was a discrepancy between the teachers' evaluation and the children's scores, pointing out that some children may be accepted by their peers but not by adults and vice versa. Boney suggested that the scores represent measurements of different concepts - the one social leadership, the other, friendship. The children's tests measured subjective preference whereas the teachers' evaluations were based on social success and had considered scholastic achievement and interest in school work.

Esther B. Frankel and Riva Potashin (1944), however suggested that at that time sociometric tests were one of the best techniques for arriving at a determination of either friendship or social acceptance of members of a group. Esther Frankel (1946) in a study of the social relationship of nursery school children set out to compare sociometric

and observational methods in their use of the study of such relationships. Her subjects were a group of 23 seniors, three to five years old, attending the nursery school at the Institute of Child Study at the University of Toronto. Frankel pointed out two problems to consider when administering a sociometric test to preschoolers: (1) the child's ability to express levels of preference and (2) making the test questions meaningful to the child. (i.e. placing them within the frame of reference of the child's interests and activity.) Frankel's procedure was to ask the child, "What do you like to play with (in the garden, play room? Who would you like to sit with)?" Immediately following his answer with, "Who do you like to play with best?" (in the garden, play room, sit with) "Who else?" and "Who else?" The three answers were considered choices and were weighed five, three and two in order of preference.

These scores were correlated with the same choices, unweighed and little difference was shown between the two methods of scoring, suggesting, said Frankel, that "The children do not discriminate between levels of choice" (p. 214). Observational method was employed during the same school period. The observations were made of play contacts during a one hour free play period. These were of two minute duration with eight minute intervals and were recorded two days a week for six weeks. Differences were evident between the children's verbal choices and their observed playmate

contacts. Frankel deduced that the two scores did not measure identical phenomenon but two aspects of it.

It may be that at the extremes of the scale there is a factor of "acceptability" in the children themselves, as against "acceptance" which is superimposed by the social structure of the group (p. 217).

When comparing the choices made on the sociometric test and the play contacts, it was noted that the children expressed verbal preference for a greater proportion of frequent play contacts, that "all the children had play contacts with more children than they chose at the test" (p. 218) and that "all the children expressed a verbal desire for some of their frequent playmates and they all played often with some of their verbal choices" (p. 218). A comparison was also made of friendship groupings obtained in the sociometric test with those obtained from observations. Here again, Frankel found the data from the sociometric test and the observations to be supplementary rather than identical and she suggested that "at the preschool age...it seems to be necessary to use both methods in order to have a better understanding of the child's social status and his friendships (p. 218).

In the 1950's studies on children's social status became more detailed and complex. The questions asked by researchers became more insightful, probing, and covered a wider span of child behavior. Theron and Marie Alexander (1952), for example, in a study of personality and social status, questioned the evaluation of children, by adults, in terms of their social status. That is, the assumption that



a child was wholesome and well adjusted because he was popular. The authors argued that the evaluation was often made according to adult standards and not according to the children's needs or motivations, and they asked, in their study, whether we should then rely on the children's own evaluation by their choices. Theron and Marie Alexander (p. 207) posed the question, "Is it correct to assume that if a child is chosen often by children for their activities that such a child is meeting effectively the problems of his development?" In their study of 27 children, aged 9 years to 10 years 3 months, who were given a series of three sociometric tests, Joe was found to be the most chosen child in all three situations. Joe's characteristics were then studied through a battery of psychological tests (such as the TAT, Rorschach, Stanford-Binet and others). The testing revealed Joe to be an emotional isolate, a follower with a need for both direction and punishment, full of feelings of inadequacy and self blame. It appeared that Joe was chosen, not because of desirable characteristics, but to serve as an outlet for aggression and domineering needs of the other children. The conclusions reached by the Alexanders were that "children's choices may not be a criterion of value on which to base adjustmental goals" and that "it is not indicated that simply because a child is chosen by his peers that he is effectively meeting his developmental tasks or possesses desirable personal characteristics" (p. 212).

Gronlund (1951, p. 6) attempted "To determine the accuracy of teachers' judgments concerning the degree to which sixth grade pupils are accepted by their classmates, and the relationship of certain variables to the accuracy of these judgments" (p. 6). To do this Gronlund used a population of 1,258 pupils in forty sixth grade classes and forty white, women teachers from Flint, Willow Run and Ypsilanti public schools. The pupils were fairly evenly divided by sex with an average age of 11.8 years for boys and 11.5 for girls. Personal data was obtained from the teachers. Included were their age, length of teaching experience, length of time in present position, total number of semester hours of college training, recency of college training, number of semester hours in psychology. Information was also obtained as to whether or not a course in child development had been taken and the teacher's marital status. These personal-data variables were collected in order to determine their relationship to teacher accuracy. Teachers were also asked to indicate the three girls and the three boys they most preferred having in their classrooms and the three boys and three girls they least preferred as pupils in their respective classrooms. Sociometric status of the children was obtained through a written sociometric test form on which a child was asked to choose five classmates with whom he would prefer to work, five preferred classmates for play, and five classmates near whom he would prefer to sit. The teachers were asked

to make judgments concerning the sociometric status of pupils in her classroom by indicating on a teacher judgment form the ranking order of acceptance of a child by his classmates as a work companion, play companion and sitting companion. This was done separately for boys and girls.

Pearson product moment coefficient of correlation was used to analyze teachers' judgments and the children's sociometric scores, and the accuracy of teacher judgment and the personal-data variables. Gronlund found that teachers differed in the accuracy of their judgments. He suggested that there appeared to be a special insightful quality and understanding of children's social development which possibly contributed to accuracy of judgment and which could possibly be taught to teachers as part of their training. This appeared particularly sound advice in light of the finding that a difference existed in the accuracy of teacher judgments between those teachers who had taken a course in child development and those who had not. Gronlund (p. 53) found that the difference was in favor of greater accuracy by the teachers who had taken this course which was "concerned with the development of the whole child, in which emphasis was given to social adjustment and the application of the sociometric technique."

A difference was also found in the accuracy of teacher judgments of the sociometric status of the children on the different criteria, with judgments on sociometric

status of work and seating companions being somewhat more accurate than sociometric status of play companions. No relationship was found between the average accuracy of teacher judgments and teachers' age, marital status, years of teaching experience, length of time in present position, recency and semester hours of college training, semester hours in education courses, psychology courses and size of class. There was a tendency for teachers to over-judge the sociometric status of the three boys and three girls they most preferred in their classroom, and to under-judge the sociometric status of the pupils least preferred. There was also a tendency for the more greatly biased teachers to be less accurate in their overall judgments.

Gronlund has shown then, that teachers judgments of sociometric status of children in their groups is not always accurate and could be based on adult criteria rather than social adjustment criteria of children. His significant contribution was his suggestion that teachers can be trained to become more perceptive and thus more accurate judges of children's social adjustments.

Ruth Emerson (1953) studied factors related to sociometric status in a group of 16 four and five year old nursery school children. She pointed out that by age four the child is a truly social being and suggested that the acceptance or rejection of an individual by his peer group and the adequacy of personality development are closely



related.

Ruth Emerson (1953) used a non-specific, one criteria sociometric test to obtain the sociometric status of a child. "To obtain the score of acceptability the rejections received by a child were subtracted from the acceptances and the children ranked in order" (p. 18). The group was then split into three groups, according to the children's score. A group of high sociometric status, a group of children who were well accepted by their peers and a group of low sociometric status, those poorly accepted by their peers. Each child was also observed for 25 minute intervals, during free play, for a period of six weeks. The roles the child played in his contact with others (seven roles: imitator, follower, participator, watcher, disruptor, decision maker, expeditor), materials played with and other information deemed pertinent were recorded. Emerson (p. 45) found that "the sociometric test resulted in a reasonable spread of scores for the group" and she concluded that

the sociometric technique can be used with pre-school children to obtain a ranking of sociometric status. The children with whom the subjects played most frequently were, generally, the ones chosen by them in the sociometric test (p. 48).

Biehler (1954), set out to determine

...whether or not the sociometric choices of kindergarten children correspond with preferences manifested in actual play associations; and to study the stability of these two types of choice over a period of time (p. 45).

The subjects were 25 children in the kindergarten of the



University of Minnesota Institute of Child Welfare. During the period studied the 14 boys and 11 girls were all five years of age. They had an average IQ of 125.6 and came from comparable socio-economic background. The procedure consisted of behavior sampling technique and a picture completion sociometric technique. The writer recorded the companion preferences for all the children at a particular moment during free play, by observing for a few minutes and recording the names of those children playing together. This procedure was repeated after 10 minutes. For reliability check an assistant teacher concurrently recorded behavior samples. The period of observation was for one week. To elicit sociometric responses, two sets of headless line drawings of groups of children in play situations were used. Photographs of all the children in the kindergarten were presented to the child as "cut-outs". The child was to complete the headless line figures by adding a cut out face. Each child was interviewed individually with the cut outs spread in front of him. He was asked to name them all, to make him aware of all his classmates. A series of five drawings were presented: the first drawing had five figures in it, the second had three drawings and the third had two figures. Each child was asked to place his own face on one of the figures in the first picture and complete it by adding cut outs to represent four favorite playmates. The same procedure was repeated for the second drawing, picking two

favorites out of the previous four, and for the third drawing picking one favorite out of the last two. The companion selected for the last picture was considered to be the child's first choice. Two different sets were presented in this manner, immediately following the time sampling period. There was a month interval between the two testing sessions. Results of both first and second sessions indicated high agreement between sociometric test and behavior samples on the first choices, less the second and third. For the group as a whole sociometric choices were more stable than behavior choices. Biehler<sup>1</sup> concluded that:

For the kindergarten studied, it could be said, that each child maintained a fairly consistent and permanent desire to play with a certain specific companion and was successful in satisfying this desire quite frequently in play situations, but that secondary playmate preferences depended for the most part on the situation at the moment (p. 50).

Speroff (1955), suggested that a lack of research was manifest, as to the extent, durability, consistency and stability of sociometric choices, and proposed to determine the stability of sociometric choice among kindergarten children. The author posed the following question:

In an actual situation where sociometrically chosen individuals are allowed to interact with one another, within the confines of a greater group, how long does such a sociometric choice remain unchanged (p. 109)?

For his subjects, Speroff chose 11 kindergarten children (four boys and seven girls), selected from a group of 41 in a morning grade of a public school. The 11 children

in this experimental group were those "who chose an individual who was not chosen more than once by another child" (p. 129). The children were asked why they had made the particular choice and the information given was recorded. Each of the sociometrically chosen was asked to play with his choser during play period. The children were tested every week for a 10 week period and their choices, reasons for choice and changes of choice were recorded. From his findings, Speroff concluded that the boy group was more variable (less stable) in its sociometric selections than was the girl group and that "reasons or causes given for making...changes also revealed the boys to be more variable" (p. 131).

Norman E. Gronlund (1955a) in a study of 1,258 pupils in 40 sixth grade classes attempted to provide evidence regarding the extent to which social status may be regarded as a reliable index of social acceptability of pupils in a classroom. The procedure he used was to relate an individual's sociometric status for one criterion to his sociometric status for each of two other criteria. Pearson Product Moment was used to correlate the scores. On the basis of his findings Gronlund concluded that: "Sociometric status based on criteria of a general nature provides a fairly reliable index of the social acceptability of pupils in classroom groups" (p. 176).

He cautions, however, that for purposes other than

determining social acceptability, more specific criteria should be used in a sociometric test.

Gronlund (1955b) in a second article, attempted to refine sociometric studies by trying to determine "the relative stability of classroom social status with unweighted and weighted sociometric choices" (p. 345). In his study, Gronlund administered a sociometric test to all of the pupils in nine public school classrooms (216 of these were included in this study). Each pupil was requested to choose "the five classmates with whom he most prefers to work". The test was given on two occasions, four months apart. Four different scoring methods, for each test administration determined a child's social status: five choices unweighted; five choices weighted five, four, three, two, one, respectively; three choices unweighted; and three choices weighted three, two, one respectively. Spearman Rank difference method of correlation was used to determine the relative stability of the results obtained by the four scoring methods over a four month period. Although "there was no difference in the relative stability of unweighted and weighted choices at either the five-choice or three-choice level" (p. 347), the five-choice level appeared to be more consistently stable than the three-choice level and the arbitrary weighting or nonweighting did not seem to affect this stability. Gronlund used percentages to determine the stability of various sociometric choice levels. The results



indicated that "the first choice was most stable, with a steady decrease in stability to the fifth choice" (p. 353). Gronlund analyzed the stability of the High and of Low Social Status Scores using five unweighted choices. He concluded that both High and Low Social Status Scores were very stable over a four month period, indicating that "the extreme social status scores are more stable than those in the center of the distribution" (p. 350). In light of the findings Gronlund suggested that "five unweighted choices be allotted to each sociometric criterion where the classroom social status of pupils is being determined" (p. 353).

Margaret Jenne Dunnington (1957) considered areas of disagreement in preschool sociometric research and set out to investigate these "by means of an adapted sociometric method which incorporates both choice and rejection into a single index of status" (p. 93). Among the important points of disagreement, according to Dunnington, were the questions as to "whether or not nursery school children have or can express preferences among their peers" (p. 93); "are preschoolers' verbalized reactions to their peers stable or merely expressions of the moment?" (p. 94) and are young children able to differentiate levels of preference? Controversy has existed also in the areas of securing and analyzing sociometric data and the possible incorporation of rejection in the data. Based on these areas of disagreement Dunnington posed the following questions:



1. Are there demonstrable preferences among the preschool subjects?
2. Are the subjects' verbalized preferences stable?
3. Are levels of preferences differentiated by the subjects?
4. Does the use of a method which secures rejections result in status groups with different memberships from those obtained by the choice-only method?
5. Are high and low status children more "noticed" than the children in the middle status group? (p. 95)

Fifteen children, the entire senior group of a college laboratory nursery school, were used in this study. The children ranged in age from four years one month to five years one month. The children were interviewed individually immediately upon their arrival at school "in order to elicit responses based on accumulated experience rather than those occasioned by proximity or temporary reaction" (p. 95).

Three choices were secured by asking each child, "Whom do you like to play with best in nursery school?" And then, "Anyone else?" And "Anyone else?" Rejections were obtained in the same manner by asking, "Whom in the nursery school don't you like to play with?" "Forced responses" were elicited by asking whether or not the respondent would like to play with a child whose name was not previously volunteered. The same procedure was repeated after 60 days. The choices were weighted on a 28 point scale. A +14 for the first choice, a +7 for the second, a +5 for the third and a +1 for "forced" choice responses. Rejections were weighted a -14 for first rejection, a -7 for the second, a -5 for the

third and a -1 for "forced" rejection. The sociometric score of each child was the sum total of his choice and rejection scores which was then ranked. The subjects were divided into low, middle and high groups. The data were analyzed in terms of both choice only and choice rejection methods.

Dunnington's conclusions, relevant to the problem areas investigated, were:

1. The subjects had and were able to verbalize preferences among their peers.
2. Individual statements of preferences changed but membership within status groups remained identical from test to retest....
3. The subjects of this study seemed to differentiate levels of preference.
4. Results derived by the present method differ from those of the "choice-only" method....
5. The majority of the children in the high and low status groups had higher "notice" scores than those in the middle status. (p. 101)

Dunnington also pointed out that "There is evidence that the method used in this study brought out a fuller, and more consistent, sociometric group description than is obtained in the choice-only system" (p. 101).

Boyd R. McCandless and Helen R. Marshall (1957) devised a picture sociometric technique for use with pre-schoolers. The researchers pointed out that although sociometric tests have proven useful in the study of older groups, the usefulness of these methods for the preschool age range has not been demonstrated. They suggested that the reasons for this may be related to methodology. McCandless and

Marshall were

...convinced that friendships of a reasonably stable and discriminating sort exist at the preschool ages and believe that the developing of methods of studying such friendships in a precise and reliable fashion would constitute a worthwhile contribution to the social-behavioral sciences (pp. 139-140).

In their study McCandless and Marshall sought to determine whether stability over a period of time, is a characteristic of social acceptance measures of children in preschool groups, and whether their sociometric choices are significantly related to "teacher judgments of friendship of these children". Subjects were 48 children of three preschool groups in the Laboratory Preschools of the University of Iowa's Child Welfare Research Station. The majority of the children had not previously attended a station preschool. The teachers in each group were "generally equated in number and for experience". The procedure devised by the authors was a picture sociometric technique where

...each child was asked to name or point to photographs of preferred playmates during an individual interview. Three choices of playmates were encouraged for each of three activities: outside play, inside play, and listening to stories (p. 141).

Photographs of the children 3 1/8 in. by 4 5/8 in. were placed in four rows of five pictures on white wallboard which was fastened on the wall at the eyelevel of a seated child.

One half of a group, randomly assigned, viewed one of two random photograph position orders at the first sociometric interview. Orders were alternated for subsequent interviews of all the children (p. 141).

The experimenters made certain that all pictures were pointed to and named by each child before choices were requested. "The wording of sociometric choice questions, 'Who do you like to play with (outdoors)?', was the same in all interviews" (p. 141).

Three testing sessions were completed for all subjects with a mean calendar day interval of 10.5 days between tests.

A child's sociometric score was the sum of the choices of the child as a playmate by all Ss for any and all of the interview situations.... All first choices were weighted five points; second choices, four points; third choices, three points; fourth choices, two points; and fifth or later choices, one point (p. 142).

In each group teacher judges of friendship consisted of one associate teacher and two assistant teachers.

These judges were asked to list the four best friends in order of closeness for each child in the group.... The teacher judgment score, then, that was used to compute relationships was the mean of all teachers' judgments for a given child at a specified time (p. 142).

Product moment correlations were used to analyze the data. The results obtained by the authors showed a significant relationship between the children's sociometric choices and the pooled teacher judgment scores of the children's choices, although individual teachers were found to vary markedly in their ability to judge the child's sociometric choice of best friends. Also "both the children's sociometric scores and teacher judgment scores were shown to be stable over 10 to 30-day intervals in newly formed groups"



(p. 146). McCandless and Marshall thus "have demonstrated that a useful technique for measuring preschool children's friendships can be developed and shown to be useful" (p. 147).

Helen Marshall and Boyd McCandless (1957), following the study which established their picture sociometric technique, undertook a study in prediction of social behavior of preschool children. They set out to investigate the three following questions:

1. Is the degree of a child's participation in qualitative categories of spontaneous play related to the child's sociometric score and to teacher judgments of social acceptance?
2. Is observed social acceptance in preschool free play predicted by both sociometric scores and teacher judgment scores?
3. Do choices of the children's three best friends in the picture sociometric technique and in the judgment of teachers agree with those observed in play to an extent greater than chance? (p. 150)

The subjects were children in each of two groups at the Laboratory Preschools of the State University of Iowa's Child Welfare Research Station. Age range in Group I was 3-4 to 5-2 years, in Group II it was 4-1 to 5-7 years, at the beginning of the testing series. The children were either strange to each other or only slightly acquainted at the time the groups were started. The teachers were equated for number and experience with one experienced head teacher and two graduate assistant teachers in each group. The children's sociometric scores and teachers' judgments of friendship were obtained in the same manner as described



above. (McCandless and Marshall, 1957). The method of observation devised by the authors for the present study made possible a record of four qualitative aspects of social interaction for each of 1,114 two-minute observations. The aspects, or categories of social interaction were: Associative play, where the children seemed aware of a common activity or interest; friendly approach, "A verbal approach or response to another child that is neutral, pleasant, friendly or helpful" (p. 152); hostile interaction, "Verbal or physical approach or response that interferes with the ongoing activity of another child, is a direct attack on another child, or is judged deliberate 'snubbing' withdrawal from some approach of another child" (p. 152); conversation if "of a friendly nature occurs between two children for one half minute or more of the two-minute observation time" (p. 152). Two different scores were obtained from these observation records for each child, a play interaction score and a best friend score, limited to three friends with whom the child had the largest number of recorded interactions. The latter score was deemed by Marshall and McCandless to be an observation social acceptance score comparable to the child's sociometric score and the teacher judgment score. Correlation coefficients were computed between sociometric score and observed play interaction scores, between pooled teachers' judgment scores and play interaction scores, and for observed best friend scores with sociometric and teacher

judgment scores. The following relationships were found between these measures of social acceptance:

1. The degree of the child's participation in social interactions of a friendly nature in spontaneous play was positively related to the child's sociometric score and to teacher judgments of social acceptance. Hostile play interactions were not related to sociometric scores but had some positive relations with teacher judgment scores.

2. Social acceptance in spontaneous play situations was related to both sociometric and teacher judgment measures.

3. Choices of the child's three best friends in the picture sociometric technique and in the judgment of teachers agreed beyond chance with those observed in play. (p. 158)

Marshall and McCandless (p. 158) believed that the results of their study demonstrated "the possibility of measuring preschool-aged children's participation in discriminating friendships with other children."

The sixties have not given rise to many published studies in the area of sociometry. Boyd McCandless did a number of sociometric studies of preschool children in the Appalachian area and in the headstart program in Atlanta, neither of which have been published, nor were available in unpublished form.

The above review of literature leads one to conclude that in spite of the numerous studies carried out in the general area of sociometry, there is still a shortage of published research in the area of preschool sociometry. It is this lack of research and the belief of this writer in the existence of significant social relationships at the

preschool level that prompted the present study. There appears to be an uncertainty of both conclusions and methodology in relation to all age levels studied and particularly at the preschool level. The questions aroused by the review of literature were: 1. Are teacher judgments of social relationships at the preschool level more accurate or less accurate than at other age levels? 2. Do preschoolers exhibit degrees of social preference and rejection toward their schoolmates in the form of sociometric status scores? 3. If so, how stable are these sociometric status scores over a specified period of time? 4. Will different methods of statistical analyses produce different results?

Should the present study succeed in making some contribution to preschool sociometry through answering some of these questions then the effort will be justified.

## CHAPTER III

### PROCEDURE

The methods used in the present study are discussed under the headings of selection and description of the study group, collection of data and treatment of data.

#### Selection and Description of the Study Group

The population for this study consisted of twelve children in each of the junior and senior groups enrolled in the School of Home Economics Nursery School at the University of North Carolina at Greensboro.

The juniors ranged in age from 35 months to 47 months, at the start of the school year; the seniors' ages were 47 months to 59 months. None of the children were below average in intelligence. All were from the higher middle socio-economic level, with parents in professional or managerial occupations. All of the children were white.

The teachers were - a head teacher of the senior group with 25 years of teaching experience and a Master's Degree in Child Development. The teacher of the junior group had six years of teaching experience, a Master's degree in child development and partial credits toward a doctoral degree in child development. Two graduate students were assistant teachers. Neither had been employed in full

time teaching positions but had been employed in laboratory teaching centers.

#### Collection of Data

The teachers of the junior and senior groups at UNC-G nursery school were notified by letter as to the objectives of the study. The researcher later met with the teachers and explained their part in the study. The teachers were given forms on which they were to put their evaluation scores of the sociometric status of each child in their group. Their judgments were to be based on observation of the children, in their respective groups, during the period generally corresponding to the testing period.

Two Polaroid, black and white photographs were taken of each of the children, in the same place and with the same background. The photographs were checked with the teachers for typical expression and image of the child. When the likeness was not typical and was not satisfactory to the teachers, retakes were made immediately. The one judged most typical by the teachers was selected for use in the test.

Since it would have been impractical to interview all the children immediately upon arrival, the interviewer waited until all were present in their rooms. She then took the children into the testing room one at a time, according to a prearranged randomized order. The randomizing procedure



involved the removal of twenty-four cards from a deck of bridge cards and grouping them in two groups of 12 cards each. A child's name was written on each card and the cards were then shuffled and cut five times. Each stack of 12 cards was laid face down and the cards were turned over one at a time revealing a child's name and thus indicating his turn in the interviewing order. (Fesmire, 1965). The child was asked to accompany the researcher for a game with the pictures she had taken the week before. The sociometric testing took place in a small private room, off the junior play room, where a small round table and two child-size chairs were set up. The child and the researcher sat side by side at the table. On the table in front of the child was placed a board on which were arranged the photographs of the respondent's peers. These were randomly arranged for each child respondent, using the same randomizing process mentioned above. Before proceeding with the questioning, the researcher, with the child, named all the photographs in the order in which they were arranged to make certain the child recognized all his peers. The respondent was then asked to point to the child with whom he would want to play with most. (Show me who do you want to play with best of all?) The child's first spontaneous response was noted as first choice and was assigned a weight of +5. The child was then asked, "Who else do you want to play with?" This second response was considered the child's second choice and

was weighted a +3. The third response to the question, "Who else?" yielded a third choice and was weighted a +1. The researcher then asked the respondent to look at all the pictures again and show her whom he would not want to play with. (Show me who you don't want to play with?) The child's first response was considered to be the most rejected and was assigned a weight of -5. The second response was considered somewhat rejected and was weighted a -3. The third response was presumed to indicate mild rejection and was weighted a -1. The combined choice and rejection points for each child yielded his sociometric score.

The children's sociometric scores were correlated with the mean of the combined teacher judgment scores for each of their respective groups.

This same procedure was repeated three separate times at three week intervals. The original randomized order of interviewing and picture presentation remained the same for each of the three testing periods.

#### Treatment of Data

To determine stability of the children's sociometric scores, the investigator used the Spearman rank correlation coefficient:  $r_s$ . The sociometric scores of the first test were correlated with those of the second test and the third; as well as scores of the second test with scores of the third. Spearman rank correlation coefficients were also employed to relate age and sociometric scores. The children

were divided into six month age levels and the mean age was then correlated with the mean sociometric score of the children in the particular age level. To determine the difference between the children's sociometric scores and the teachers' judgments of the children's social status in the group, the Wilcoxon matched-pairs signed-ranks test was used.

These nonparametric tests were selected because the subjects used in this study do not represent a random sample. The tests make no assumption about the shape of the population from which the scores were drawn. Spearman rank correlation was chosen as the measure of correlation and the Wilcoxon matched-pairs signed-ranks test, rather than other nonparametric tests because of the ordinal level of measurement of the scales in this study. Siegel (1956) was used as a guide for the treatment of data.

## CHAPTER IV

### FINDINGS

It became apparent to the investigator when testing the three year olds, that they were unable to discriminate between choice and rejection on this type of test. During a test session, the three year old would point to a particular child as his most favored playmate selection; he would immediately after point to the same child as being his least favored or most rejected playmate selection. Three children, out of the twelve tested, refused to single out any one child as either a favored or rejected playmate, but repeatedly stated, "I like all of them." (It should be noted here that at the University of North Carolina - Greensboro Nursery School, friendship and mutual acceptance are stressed as part of the daily program.) The majority of the three year olds needed to be prodded to respond and were quite indefinite both in their verbal replies and in their manner of pointing to the pictures. (They allowed their finger to slide and circulate all over the picture board.) After careful consideration of the unclear responses and the preliminary analysis of the data, it seemed more feasible to delete any further analysis and discussion regarding these children with one exception, and that being consideration of

the relationship between age and sociometric scores.

The remainder of the thesis will be confined to the findings in the four year old group. Analysis and discussion will be presented in terms of the questions raised earlier.

1. How stable are the sociometric scores in a group of four year old children enrolled in a nursery school?

To determine stability of the children's sociometric scores, Spearman rank correlations were used to compare test 1 to test 2, test 2 to test 3 and test 1 to test 3 (Appendix B). No significant correlations were found among any of the three tests. However, when considering choices only, correlations, significant at the .01 level, were present for all of the comparisons, as shown in table 1. This pointed to a strong association and therefore stability in the choice only sociometric scores of the four year olds, in this population.

Table 1

THE STABILITY OF SOCIOMETRIC CHOICE SCORES,  
ON THREE DIFFERENT TESTS FOR A GROUP  
OF FOUR YEAR OLD CHILDREN

|             | N  | Spearman rank-correlation<br>coefficients : $r_s$ |
|-------------|----|---|
| Test 1 & 2  | 11 | .813*   |
| Tests 1 & 3 | 10 | .718*   |
| Tests 2 & 3 | 12 | .829*   |

\* significant at the .01 level, or better (for N = 12 - .712).



The picture sociometric test appears to be reliable for use with four year olds. The lack of correlation with regard to rejections reflected the instability of discriminative ability of the four year old rather than the unreliability of the test. Presence of stability of choice relationships among these four year olds was further supported when individual choices were considered, as shown in table 2. Five out of 12 children or 42% exhibited 100% agreement in their first choice selections; 58% showed 66.6 percent first choice agreement. Seventy-five percent of the children showed 66.6 percent agreement in their second choice selections; while 25% showed no second choice agreement. Only 42% of the children showed 66.6 percent agreement in their third choice selections; 58% showed no third choice agreement. Less stability was shown with regard to rejections. Only 17% of the children showed 100% agreement on first rejection selections; 50% showed 66.6% first rejection agreement and 33% showed no agreement: Agreement lessened greatly with second and third rejection selections, with one child offering no second or third rejections at all.

Table 2

PERCENT OF CHOICE AND REJECTION AGREEMENT  
OF THE SOCIOMETRIC SELECTIONS OF  
A GROUP OF FOUR YEAR OLDS,  
ON THREE TESTS

| Respondents | first<br>choice | second<br>choice | third<br>choice | first<br>rejec-<br>tion | second<br>rejec-<br>tion | third<br>rejec-<br>tion |
|-------------|-----------------|------------------|-----------------|-------------------------|--------------------------|-------------------------|
| a           | 66.6            | 66.6             | 66.6            | 0                       | 66.6                     | 66.6                    |
| b           | 100             | 0                | 0               | 100                     | N.R.*                    | n.r.*                   |
| c           | 66.6            | 66.6             | 0               | 66.6                    | 66.6                     | 66.6                    |
| d           | 66.6            | 66.6             | 0               | 66.6                    | 66.6                     | 0                       |
| e           | 66.6            | 0                | 0               | 0                       | 66.6                     | 0                       |
| f           | 100             | 66.6             | 66.6            | 100                     | 66.6                     | 0                       |
| g           | 66.6            | 0                | 0               | 66.6                    | 66.6                     | 0                       |
| h           | 100             | 66.6             | 66.6            | 66.6                    | 0                        | 0                       |
| i           | 66.6            | 66.6             | 66.6            | 66.6                    | 66.6                     | 0                       |
| j           | 66.6            | 66.6             | 0               | 0                       | 0                        | 0                       |
| k           | 100             | 66.6             | 0               | 0                       | 0                        | 0                       |
| l           | 100             | 66.6             | 0               | 66.6                    | 0                        | 0                       |

It appeared, then, that greater stability is present in the choice selections of the four year olds, in this study, and that stability of choosing was greater, in first selections of either choice or rejection, than subsequent selections. The greatest stability of selections occurred

in the first choices. The preponderance of the stability of choice selections over rejections may be a function of the stress on friendship in this nursery school. Furthermore, the four year old is first developing his social sense and empathic ability and seems to delight in this newly found skill. He, thus, devotes more attention and expression to friendship and positive social interaction. The ability to discriminate is also newly found, (as evident from the response of the three year olds) and may therefore only be stable in the case of greatest rejection where attitudes may be more accutely felt.

2. Does a relationship exist between level of sociometric scores and age of children?

The children of the three and four year old groups were divided into six month age levels (4 levels) and their mean sociometric scores were compared with mean age using Spearman Rank correlation.

No significant pattern of  $r_s$  corrrelations appeared when considering six month levels. The correlations are presented in table 3. No relationship seemed to exist between the level of the sociometric scores of the children and their ages. It should be noted, however, as mentioned above, that the three year olds differ from four year olds in their ability to discriminate, and perhaps express, social relationships. It appears then that a six month age level may be nonsignificant in relation to sociometric score

level, whereas a greater age span level might be a factor in degree of sociometric score of preschoolers. A larger sample might also contribute toward different results.

Table 3

RELATIONSHIP OF SOCIOMETRIC SCORES AND  
AGE, FOR FOUR GROUPS OF CHILDREN, AT  
SIX MONTH LEVELS, ON THREE  
DIFFERENT TESTS

|        | N | Correlation<br>Coefficient: $r_s$ * |
|--------|---|-------------------------------------|
| test 1 | 4 | 0                                   |
| test 2 | 4 | -.6                                 |
| test 3 | 4 | -.5                                 |

3. Does a relationship exist between sociometric scores of the children and the teachers' judgments of these children's social status in the group?

The Wilcoxon matched-pairs signed-ranks test was used to determine the difference between the children's sociometric scores (SS) and the teachers' judgments (TJS) and is shown in table 4. Although individual teachers' judgment scores differed greatly from one another, the mean of their combined scores did not differ significantly from that of the children in any of the testing periods.  $T_1$ ,  $T_2$ , and  $T_3$  were computed for SS and TJS for each of tests one, two and three.

Table 4

CRITICAL VALUES\* OF TEACHER JUDGMENT SCORES  
AND SOCIOMETRIC SCORES ON THREE DIFFERENT  
TESTS FOR A GROUP OF FOUR YEAR OLDS

|        | N  | Critical Values: T* |
|--------|----|---------------------|
| test 1 | 12 | 37.5                |
| test 2 | 12 | 34.5                |
| test 3 | 12 | 37                  |

\* T: Critical value for N=12, on the Wilcoxon matched-pairs signed-ranks test is 14.

For N=12, T<sub>1</sub> was 37.5, T<sub>2</sub> was 34.5 and T<sub>3</sub> was equal to 37. These values of T did not allow for rejection of the null hypothesis, accepting therefore the statement that there is no significant difference between the children's SS and TJS. The four year old children in this study were capable of expressing their selections of playmates, in a verbal, sociometric test. No difference existed between these expressions and the teachers' judgments of the children's social status, which were based on observation of the children's social interaction. One can assume then that these four year olds were able to reflect, in their sociometric test, through verbal expression and with the aid of their playmates pictures, their group interaction regarding selection of playmates.



The summary, the sociometric scores of the four year olds, in this sample, appeared to be stable, with regard to choice responses only, were not associated with six month age intervals and did not differ significantly from teachers' judgments of these children's social status in the present group. The null hypothesis 1 was rejected; hypothesis 2 was not supported; and hypothesis 3 was accepted in the null form.

The picture sociometric technique appears to be an adequate instrument for use with four year olds, its reliability having been established. These children's ability to reflect and express social relationships of this type may enhance the understanding of preschoolers' social relationships in general and open doors to more detailed research and more sophisticated experimental designs.

## CHAPTER V

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### Summary and Conclusions

This study was undertaken to determine the degree of stability of sociometric scores of children enrolled in three and four year old nursery school groups during three specific time intervals; to determine whether a significant difference exists between sociometric choice-rejection scores of the children and the teachers' judgments scores of these children's social status in the group studied; and to determine whether a relationship exists between level of sociometric scores and the ages of the children in six month levels. Subjects were the 24 children enrolled in the three and four year old groups (12 in each group) at the University of North Carolina nursery school. These children were given a series of three sociometric tests, at three week intervals, during the fall semester of 1966-67 school year. Three choice and three rejection responses were recorded and weighted from a +5 to a -5. The sociometric score of a child (SS) was the sum total of his choice and rejection scores. Teacher Judgment Scores (TJS) were the mean of the combined judgment scores of a head teacher and a graduate assistant in each group. These judgments were based on

observations during testing periods. Spearman rank order correlation coefficient was utilized to relate the SS scores of the first test to the second and to the third and the second test to the third in order to determine stability of SS. Spearman rank order coefficient was also used to relate age of children and SS. The Wilcoxon matched-pairs signed-ranks test was used to compare SS and TJS.

The conclusions were: (1) the hypothesis that the older the child, the higher the SS could not be accepted. No association occurred, in this study, between age and SS in six month levels. An association did become apparent in the course of testing between age and the ability to discriminate and/or express social relationships of choice and rejection. (2) The null hypothesis that there is no association between the SS different test periods was rejected, with regard to choice responses, making it possible to accept the existence of an association between SS in time and hence the existence of stability of SS of this group of four year olds. Greater stability occurred in choice selections than did occur in rejections. (3) The null hypothesis that there is no significant difference between the children's SS scores and TJS could not be rejected, suggesting the reflection of the children's observable daily interactions in their test expressions. Analysis of data and conclusions were confined to the four year old group. The conclusions of this study concurred with the conclusions of the one by McCandless and

Marshall (1957).

Recommendations for Further Study

1. Considering the stability of social relationship among preschoolers, of upper and lower socio-economic status and the culturally deprived.
2. Relating the SS of children in the different socio-economic strata with their teachers with regard to the teachers' socio-economic status.
3. Exploring the personality variables of children of different sociometric scores.
4. Relating variables of the children's family life to their sociometric scores. Variables such as mother's active time spent with child, amount and type of family leisure activities, number and ages of siblings in the home.
5. Relating teaching methods and preschool atmosphere to stability of SS of the children enrolled in the school.
6. Determining whether sociometric status of the children will be changed with manipulation of car pools, lunch seating arrangements, arranging play or work groups and others, and if so can personality adjustment be effected as a result of sociometric change?
7. Developing a technique or scoring method to determine sociometry in groups of three year old children.

The writer feels that with improved methods and techniques in the area of preschool sociometry and with the

greater institutional social group organization of children of preschool age, both the possibilities and the needs for research in this area are virtually limitless.



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APPENDIX A

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phone: 275-5231

Dear \_\_\_\_\_:

I wish to take this opportunity to thank you for your forthcoming cooperation as I carry out the research for my master's thesis.

The objective of the study is to correlate sociometric score of each child with the mean judgment score of both head teacher and assistant teacher in each of the three and four year old groups. A further objective is to determine degree of stability of a phase of social relationships. Sociometric test scores and teacher judgments will be obtained and correlated from three test series administered three weeks apart. Test one will be given the week of October 31, test two the week of November 21 and test three the week of December 12.

To further clarify the study and your participation in it, I would like to meet with you on Friday, October 28, at 12:45 at the UNC-G Nursery School. Should this timing not be convenient for you please let me know.

I look forward to working with you and the children.

Sincerely yours,

Ronnie Kutchei



# APPENDIX B

Table 5

STABILITY RELATIONSHIP OF SOCIOMETRIC SCORES  
OF FOUR YEAR OLD CHILDREN ON THREE TESTS

Relationship of test one to test two:

| Seniors | SS-1<br>X | SS-2<br>Y | Rank of<br>X | Rank of<br>Y | $d_i$ * | $d_i^2$ |
|---------|-----------|-----------|--------------|--------------|---------|---------|
| a       | -13       | 0         | 1.5          | 7            | -5.5    | 30.25   |
| b       | -7        | +2        | 4            | 9.5          | -5.5    | 30.25   |
| c       | +5        | +15       | 8.5          | 11           | -2.5    | 6.25    |
| d       | +5        | -11       | 8.5          | 1            | +7.5    | 55.25   |
| e       | +1        | -3        | 6.5          | 5.5          | +1      | 1       |
| f       | -10       | -3        | 3            | 5.5          | -2.5    | 6.25    |
| g       | +9        | +2        | 10           | 9.5          | + .5    | .25     |
| h       | +18       | +23       | 12           | 12           | 0       | —       |
| i       | -13       | -10       | 1.5          | 2            | + .5    | .25     |
| j       | -3        | -6        | 5            | 3            | +2      | 4       |
| k       | +11       | +1        | 11           | 8            | +3      | 9       |
| l       | +1        | -5        | 6.5          | 4            | +2.5    | 6.25    |

149.00\*\*

\* N = 11

\*\*Spearman rank correlation coefficient for N=11 which will allow rejection of  $H_0$  at .05 level is equal to, or greater than, .530; the  $r_s$  in this relationship is .320 which is not a critical value for rejection of  $H_0$ .

Table 6

STABILITY RELATIONSHIP OF SOCIOMETRIC SCORES  
FOUR YEAR OLD CHILDREN ON THREE TESTS

Relationship of Test One to Test Three:

| Seniors | SS-1<br>X | SS-2<br>Y | Rank of<br>X | Rank of<br>Y | $d_i^*$ | $d_i^2$ |
|---------|-----------|-----------|--------------|--------------|---------|---------|
| a       | -13       | -11       | 1.5          | 3            | -1.5    | 2.25    |
| b       | -7        | -12       | 4            | 2            | +2      | 4       |
| c       | +5        | +7        | 8.5          | 10           | -1.5    | 2.25    |
| d       | +5        | +7        | 8.5          | 10           | -1.5    | 2.25    |
| e       | +1        | +5        | 6.5          | 8            | -1.5    | 2.25    |
| f       | -10       | -15       | 3            | 1            | +2      | 4       |
| g       | +9        | +1        | 10           | 6            | +4      | 16      |
| h       | +18       | +7        | 12           | 10           | +2      | 4       |
| i       | -13       | +3        | 1.5          | 7            | -5.5    | 30.25   |
| j       | -3        | -7        | 5            | 4            | +1      | 1       |
| k       | +11       | +27       | 11           | 12           | -1      | 1       |
| l       | +1        | -4        | 6.5          | 5            | +1.5    | 2.25    |

71.70\*\*

\* N = 12

\*\*Spearman rank correlation coefficient for N=12 which will allow rejection of  $H_0$  at .05 level is .506 or more;  $r_s$  in this relationship is .749, critical value at the .01 level. Therefore  $H_0$  may be rejected; i.e. a relationship does not exist between test one and test three showing some stability in sociometric scores of these four year olds, between test one and test three.

Table 7

STABILITY RELATIONSHIP OF SOCIOMETRIC SCORES  
OF FOUR YEAR OLD CHILDREN ON THREE TESTS

Relationship of Test Two to Test Three:

| Seniors | SS-2<br>X | SS-3<br>Y | Rank of<br>X | Rank of<br>Y | $d_i^*$ | $d_i^2$ |
|---------|-----------|-----------|--------------|--------------|---------|---------|
| a       | 0         | -11       | 7            | 3            | +4      | 16      |
| b       | +2        | -12       | 9.5          | 2            | +7.5    | 55.25   |
| c       | +15       | +7        | 11           | 10           | +1      | 1       |
| d       | -11       | +7        | 1            | 10           | -9      | 81      |
| e       | -3        | +5        | 5.5          | 8            | -2.5    | 6.25    |
| f       | -3        | -15       | 5.5          | 1            | +4.5    | 20.25   |
| g       | +2        | +1        | 9.5          | 6            | +3.5    | 12.25   |
| h       | +23       | +7        | 12           | 10           | +2      | 4       |
| i       | -10       | +3        | 2            | 7            | -5      | 25      |
| j       | -6        | -7        | 3            | 4            | -1      | 1       |
| k       | +1        | +27       | 8            | 12           | -4      | 16      |
| l       | -5        | -4        | 4            | 5            | -1      | 1       |

239.00\*\*

\* N = 12

\*\*Spearman rank correlation coefficient for N = 12 which will allow  $H_0$  to be rejected at the .05 level is equal to or greater than .506;  $r_s$  in this relationship is .164 which does not allow for rejection of  $H_0$ ; i.e. there is no relationship between test two and test three.

Table 8

STABILITY RELATIONSHIP OF, CHOICE ONLY,  
 SOCIOMETRIC SCORES OF FOUR YEAR OLD  
 CHILDREN ON A SERIES OF THREE TESTS

Relationship of Test One to Test Two: (Choice Only)

| Seniors | SS-1<br>X | SS-2<br>Y | Rank of<br>X | Rank of<br>Y | $d_i^*$ | $d_i^2$ |
|---------|-----------|-----------|--------------|--------------|---------|---------|
| a       | 4         | 4         | 3.5          | 2            | +1.5    | 2.15    |
| b       | 8         | 10        | 8            | 9            | -1      | 1       |
| c       | 10        | 15        | 9            | 11           | -2      | 4       |
| d       | 5         | 5         | 5            | 4            | +1      | 1       |
| e       | 7         | 8         | 7            | 6.5          | +.5     | .25     |
| f       | 4         | 5         | 3.5          | 4            | -.5     | .25     |
| g       | 15        | 10        | 10           | 9            | +1      | 1       |
| h       | 28        | 28        | 12           | 12           | 0       | —       |
| i       | 1         | 8         | 1.5          | 6.5          | -5      | 25      |
| j       | 1         | 3         | 1.5          | 1            | +.5     | .25     |
| k       | 19        | 10        | 11           | 9            | +2      | 4       |
| l       | 6         | 5         | 6            | 4            | +2      | 4       |

42.9\*\*

\* N = 11

\*\*Critical value for the Spearman rank correlation coefficient for N=11, at the .05 level of significance = .530, at the .01 = .725;  $r_s$  for this relationship is .813, significant at a level greater than .01 level.



Table 9

STABILITY RELATIONSHIP OF, CHOICE ONLY,  
 SOCIOMETRIC SCORES OF FOUR YEAR OLD  
 CHILDREN ON A SERIES OF THREE TESTS

Relationship of Test One to Test Three: (Choice Only)

| Seniors | SS-1<br>X | SS-3<br>Y | Rank of<br>X | Rank of<br>Y | $d_i^*$ | $d_i^2$ |
|---------|-----------|-----------|--------------|--------------|---------|---------|
| a       | 4         | 1         | 3.5          | 1.5          | +2      | 4       |
| b       | 8         | 7         | 8            | 6            | +2      | 4       |
| c       | 10        | 13        | 9            | 10.5         | -1.5    | 2.15    |
| d       | 5         | 10        | 5            | 7            | -2      | 4       |
| e       | 7         | 11        | 7            | 8.5          | -1.5    | 2.15    |
| f       | 4         | 4         | 3.5          | 3.5          | 0       | —       |
| g       | 15        | 13        | 10           | 10.5         | -.5     | .25     |
| h       | 28        | 11        | 12           | 8.5          | +3.5    | 12.25   |
| i       | 1         | 6         | 1.5          | 5            | -3.5    | 12.25   |
| j       | 1         | 1         | 1.5          | 1.5          | 0       | —       |
| k       | 19        | 27        | 11           | 12           | -1      | 1       |
| l       | 6         | 4         | 6            | 3.5          | +2.5    | 6.25    |

48.3 \*\*

\*N = 10

\*\*Critical value for the Spearman rank correlation coefficient for N=10, is .564 at the .05 level of significance and is .746 at the .01 level of significance;  $r_s$  in this relationship is .718, approaching the .01 level of significance.

Table 10

STABILITY RELATIONSHIP OF, CHOICE ONLY,  
 SOCIOMETRIC SCORES OF FOUR YEAR OLD  
 CHILDREN ON A SERIES OF THREE TESTS

Relationship of Test Two to Test Three: (Choice Only)

| Seniors | SS-2<br>X | SS-3<br>Y | Rank of<br>X | Rank of<br>Y | $d_1^*$ | $d_1^2$ |
|---------|-----------|-----------|--------------|--------------|---------|---------|
| a       | 4         | 1         | 2            | 1.5          | + .5    | .25     |
| b       | 10        | 7         | 9            | 6            | +3      | 9       |
| c       | 15        | 13        | 11           | 10.5         | + .5    | .25     |
| d       | 5         | 10        | 4            | 7            | -3      | 9       |
| e       | 8         | 11        | 6.5          | 8.5          | -2      | 4       |
| f       | 5         | 4         | 4            | 3.5          | +1.5    | 2.15    |
| g       | 10        | 13        | 9            | 10.5         | -1.5    | 2.15    |
| h       | 28        | 11        | 12           | 8.5          | +3.5    | 12.25   |
| i       | 8         | 6         | 6.5          | 5            | +1.5    | 2.15    |
| j       | 3         | 1         | 1            | 1.5          | - .5    | .25     |
| k       | 10        | 27        | 9            | 12           | -3      | 9       |
| l       | 5         | 4         | 4            | 3.5          | + .5    | .25     |

50.7 \*\*

\*N = 12

\*\*Critical values for the Spearman rank correlation coefficient for N = 12 are .506 at the .05 level of significance and .712 at the .01 level of significance;  $r_s$  in this relationship is .829 significant beyond the .01 level. Therefore  $H_0$  of no relationship may be rejected.

Table 11

RELATIONSHIP BETWEEN SOCIOMETRIC SCORES AND  
AGE AT THE PRE-SCHOOL LEVEL  
ON THREE DIFFERENT TESTS

Test No. 1

| Age in<br>months | Score | Rank of<br>X | Rank of<br>Y | Spearman<br>R <sub>s</sub> | Significance |
|------------------|-------|--------------|--------------|----------------------------|--------------|
| 17.4             | +4.4  | 1            | 2            | .5                         |              |
| 23.9             | +5.1  | 2            | 4            | -.2                        |              |
| 29.1             | +3.2  | 3            | 1            | .5                         |              |
| 31.2             | +3.5  | 4            | 3            | .5                         |              |

APPENDIX C

average age in all month levels; the children's ages in  
months ranged from 35 to 59 months, at the beginning of  
the school year.  
average sociometric score for each of the six month level  
groups.  
The critical value for Spearman rank correlation coefficient  
for N=6 is 2.000, at the .05 level of significance;  
in this relationship is .5 - .5, not be  
rejected.

Table 11

RELATIONSHIP BETWEEN SOCIOMETRIC SCORES AND  
AGE AT THE PRESCHOOL LEVEL  
ON THREE DIFFERENT TESTS

Test One:

| X<br>Age in<br>months* | Y<br>SS** | Rank of<br>X | Rank of<br>Y | $d_i$ *** | $d_i^2$ |
|------------------------|-----------|--------------|--------------|-----------|---------|
| 37.4                   | +.4       | 1            | 2            | -1        | 1       |
| 45.9                   | +5.3      | 2            | 4            | -2        | 4       |
| 49.3                   | -3.2      | 3            | 1            | +2        | 4       |
| 57.2                   | +3.8      | 4            | 3            | +1        | 1       |

10\*\*\*\*

\*Average age in six month levels; the children's ages in months ranged from 35 to 59 months, at the beginning of the school year.

\*\*Average sociometric score for each of the six month level group.

\*\*\*N = 4

\*\*\*\*The critical value for Spearman rank correlation coefficient for N=4 is 1.000, at the .05 level of significance;  $r_s$  in this relationship is 0. -  $H_0$  may not be rejected.

Table 12

RELATIONSHIP BETWEEN SOCIOMETRIC SCORES AND  
AGE AT THE PRESCHOOL LEVEL  
ON THREE DIFFERENT TESTS

Test Two:

| X<br>Age in<br>months* | Y<br>SS-2** | Rank of<br>X | Rank of<br>Y | $d_i$ *** | $d_i^2$ |
|------------------------|-------------|--------------|--------------|-----------|---------|
| 37.4                   | +1.2        | 1            | 3            | -2        | 4       |
| 45.9                   | +4.4        | 2            | 4            | -2        | 4       |
| 49.3                   | 0           | 3            | 1            | +2        | 4       |
| 57.2                   | + .83       | 4            | 2            | +2        | 4       |

16\*\*\*\*

\*Average age in six month levels; the children's ages in months ranged from 35 to 59 months, at the beginning of the school year.

\*\*Average sociometric score for each of the six month level group.

\*\*\*N = 4

\*\*\*\*The critical value for Spearman rank correlation coefficient, at the .05 level, for N=4, is 1.000;  $r_s$  in this relationship is -.6,  $-H_0$  may not be rejected.



Table 13

RELATIONSHIP BETWEEN SOCIOMETRIC SCORES AND  
AGE AT THE PRESCHOOL LEVEL  
ON THREE DIFFERENT TESTS

Test Three:

| X<br>Age in<br>months* | Y<br>SS-3** | Rank of<br>X | Rank of<br>Y | $d_i$ *** | $d_i^2$ |
|------------------------|-------------|--------------|--------------|-----------|---------|
| 37.4                   | +4          | 1            | 3            | -2        | 4       |
| 45.9                   | +.3         | 2            | 2            | 0         | —       |
| 49.3                   | -3.2        | 3            | 1            | +2        | 4       |
| 57.2                   | +4.5        | 4            | 4            | 0         | —       |

8\*\*\*\*

\*Average age in six month levels; the children's ages in months ranged from 35 to 59 months, at the beginning of the school year.

\*\*Average sociometric score for each of the six month level group.

\*\*\*N = 2

\*\*\*\*This N is too small for analysis.

Table 14

THE RELATIONSHIP BETWEEN POSTTESTED SCORES OF A  
GROUP OF FOUR YEAR OLD CHILDREN'S JUDGMENT  
SCORES OF THE CHILDREN'S SOCIAL STATUS IN THE  
GROUP ON THREE DIFFERENT TESTS

Test Score

| Child | Teacher 1-<br>score | Teacher 2-<br>score | Teacher 3-<br>score | SS-1 | SS-2  | SS-3 |
|-------|---------------------|---------------------|---------------------|------|-------|------|
| 1     | -14                 | -25                 | -19.5               | -14  | -5.5  | -4   |
| 2     | -1                  | -8                  | -4                  | -7   | +11   | +10  |
| 3     | +2                  | +11                 | +10                 | +5   | -4    | -2   |
| 4     | -22                 |                     |                     | -5   | -23.5 | -12  |
| 5     | -11                 | -7                  | -10                 | -11  | -11   | -8.5 |
| 6     | -12                 | -4                  | -4                  | -10  | +10   | +11  |
| 7     | -1                  | -3                  | -11.5               | -9   | +4.5  | -5   |
| 8     | +24                 | +22                 | +21                 | +10  | +5    | +5   |
| 9     | -8                  | -4                  | -2                  | +10  | +10   | +10  |
| 10    | +4                  | -8                  | -8                  | -3   | +2    | +1   |
| 11    | +21                 | +22                 | +20.5               | +11  | +9.5  | +7   |
| 12    | -9                  | -4                  | -7.5                | +2   | -8.5  | -4   |

+20.5 - 17.5

$N = 12$   
In the Wilcoxon signed rank test it is the  
sum of the ranks of the positive differences, in this case  
7-17.5. Since the critical value for  $T$  when  $N$  is 12 is 17 (at  
the .05 level of significance),  $T_0$  in this relationship may  
not be rejected; i.e., there is no significant difference  
between the children's SS and SS-1.  $T_{0.05}$  is the mean of the  
combined scores of teacher one and teacher two.

Table 14

THE RELATIONSHIP BETWEEN SOCIOMETRIC SCORES OF A  
GROUP OF FOUR YEAR OLDS AND TEACHERS' JUDGMENT  
SCORES OF THE CHILDREN'S SOCIAL STATUS IN THE  
GROUP ON THREE DIFFERENT TESTS

Test One:

| Seniors | Teacher-1<br>JS | Teacher-2<br>JS | TJS** | SS-1 | $d_i$ | Rank of<br>$d_i$ |
|---------|-----------------|-----------------|-------|------|-------|------------------|
| a       | -14             | -25             | -19.5 | -14  | -5.5  | -4               |
| b       | - 1             | +9              | +4    | -7   | +11   | +8.5             |
| c       | +7              | +13             | +10   | +6   | -4    | -2               |
| d       | -28             | -9              | -18.5 | +5   | -23.5 | -12              |
| e       | -13             | -7              | -10   | +1   | -11   | -8.5             |
| f       | +12             | +6              | +9    | -10  | +19   | +11              |
| g       | -3              | +8              | +2.5  | +9   | -6.5  | -5               |
| h       | +24             | +22             | +23   | +18  | +5    | +3               |
| i       | 0               | +4              | +2    | -13  | +15   | +10              |
| j       | +4              | -8              | -2    | -3   | +1    | +1               |
| k       | +21             | +20             | +20.5 | +11  | +9.5  | +7               |
| l       | -9              | -6              | -7.5  | +1   | -8.5  | -6               |
|         |                 |                 |       |      |       | +40.5 -37.5*     |

N = 12

\*In the Wilcoxon matched-pairs signed ranks test T is the smaller of the sums of the like-signed ranks, in this case  $T=37.5$ . Since the critical value for T when  $N=12$  is 14 (at the .05 level of significance),  $H_0$  in this relationship may not be rejected; i.e. there is no significant difference between the children's SS and TJS. \*\*TJS is the mean of the combined scores of teacher one and teacher two.

Table 15

THE RELATIONSHIP BETWEEN SOCIOMETRIC SCORES OF A  
GROUP OF FOUR YEAR OLD AND TEACHERS' JUDGMENT  
SCORES OF THE CHILDREN'S SOCIAL STATUS IN THE  
GROUP ON THREE DIFFERENT TESTS

Test Two:

| Seniors | Teacher-1<br>JS | Teacher-2<br>JS | TJS** | SS-2 | $d_i$ | Rank of<br>$d_i$ |
|---------|-----------------|-----------------|-------|------|-------|------------------|
| a       | 0               | -16             | -8    | 0    | -8    | -8               |
| b       | -2              | +2              | 0     | +2   | -2    | -3               |
| c       | +17             | +10             | +13.5 | +15  | -1.5  | -1.5             |
| d       | -42             | -11             | -26.5 | -11  | -15.5 | -11              |
| e       | +3              | -23             | -10   | -3   | -7    | -6               |
| f       | -15             | +3              | -6    | -3   | -3    | -4               |
| g       | +18             | +10             | +14   | +2   | +12   | +9               |
| h       | +21             | +28             | +24.5 | +23  | +1.5  | +1.5             |
| i       | -6              | +1              | -2.5  | -10  | +7.5  | +7               |
| J       | +7              | -7              | 0     | -6   | +6    | +5               |
| k       | +21             | +18             | +19.5 | +1   | +18.5 | +12              |
| l       | -21             | -15             | -18   | -5   | -13   | -10              |

+34.5\* -43.5

N = 12

\* In the Wilcoxon matched-pairs signed-ranks test T is the smaller of the sums of the like-signed ranks, in this case  $T=34.5$ . Since critical value for T when  $N=12$ , is 14 (at the .05 level of significance),  $H_0$  in this relationship may not be rejected; i.e. there is no significant difference between the children's SS scores and TJS.

\*\*TJS is the mean of the combined scores of teacher one and teacher two.

Table 16

THE RELATIONSHIP BETWEEN SOCIOMETRIC SCORES OF A  
GROUP OF FOUR YEAR OLD AND TEACHERS' JUDGMENT  
SCORES OF THE CHILDREN'S SOCIAL STATUS IN THE  
GROUP ON THREE DIFFERENT TESTS

## Test Three:

| Seniors | Teacher-1<br>JS | Teacher-2<br>JS | TJS** | SS-3 | $d_i$ | $d_i^*$ |
|---------|-----------------|-----------------|-------|------|-------|---------|
| a       | +4              | -11             | -3.5  | -11  | +7.5  | + 5     |
| b       | +5              | +9              | +7    | -12  | +19   | +10     |
| c       | +11             | +5              | +8    | +7   | +1    | +2      |
| d       | -21             | -5              | -13   | +7   | -20   | -11     |
| e       | -9              | -29             | -19   | +5   | -24   | -12     |
| f       | +2              | -1              | + .5  | -15  | +15.5 | +8      |
| g       | +6              | +9              | +7.5  | +1   | +6.5  | +3      |
| h       | +26             | +22             | +24   | +7   | +17   | +9      |
| i       | -11             | -1              | -6    | +3   | -9    | -6      |
| j       | -8              | -7              | -7.5  | -7   | -.5   | -1      |
| k       | +19             | +21             | +20   | +27  | -7    | -4      |
| l       | -22             | -12             | -17   | -4   | -13   | -7      |
|         |                 |                 |       |      | +37*  | -41     |

N = 12

\* In the Wilcoxon matched-pairs signed-ranks test T is the smaller of the sums of the like-signed ranks, in this case T = 37. Since the critical value for T when N is 12 is 14 (at the .05 level of significance),  $H_0$  in this relationship may not be rejected; i.e. there is no significant difference between the children's SS scores and TJS.

\*\* TJS is the mean of the combined scores of teacher one and teacher two.